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تأثير التكنولوجيا في إدارة سلسلة التوريد في المملكة العربية السعودية

TECHNOLOGY DRIVEN SCM A STUDY IN SAUDI ARABIA

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ABSTRACT

Performance of the business is concerned with the maintenance of the supply chain performance in the country that determines the profit and revenue generation for the operating organizations. In this research, the concern is maintained towards the country, Saudi Arabia and the supply chain management of business in that country. The research aim is associated with the study of technology driven SCM practices in the country.

The literature findings have indicated that the supply chain models have been applied in the operating market to deal with the issues and demand of the market. The application of RFID is accepted in the country for the tracking process and the information technology to manage the information related to supply, demand and accounting process. Based on the findings positivism research philosophy, deductive approach and exploratory design; quantitative data collection has been applied. Survey method has been applied in this context and based on that 50 employees of four renowned companies such asAl Tuwairqi Group , Almarai , Nadec and Al Safi has been approached for the respond in closed-ended questions.

In addition, the research has determined the various technologies applied in the SCM of Saudi Arabia. This research has highlighted the impact of the technologies in the supply chain management. Apart from that, the research has identified the associated challenges and issues with the applied technologies in SCM. Based on the findings recommendations have been generated for the research to apply the modern ERP system to control the cost of the organization and limit the technology related issues.

Keywords: SCV, Technology, RFID, ERP, E-SCM, TMS, Communication technology.

الملخص

يهتم أداء العمل بأداء سلسلة التوريد في الدولة التي تحدد الربح وتولد الإيرادات للمنظمات العاملة.

في هذا البحث، يتم الحفاظ على البلاد والمملكة العربية السعودية وإدارة سلسلة التوريد للأعمال التجارية فيها ويرتبط هدف البحث بدراسة ممارسات إدارة سلاسل التوريد بالتكنولوجيا في الدولة.

وقد أشارت نتائج الأدبيات إلى أن نماذج سلسلة التوريد قد تم تطبيقها في سوق التشغيل للتعامل مع قضايا السوق والطلب عليها. ويتم قبول تطبيق RFID في الدولة لعملية التتبع وتكنولوجيا المعلومات لإدارة المعلومات المتعلقة بالعرض والطلب وعملية المحاسبة.



استناداً إلى نتائج فلسفة البحث الوضعي والنهج الاستنباطي والتصميم الاستكشافي وتم تطبيق جمع البيانات الكمية، وأيضا تم تطبيق طريقة المسح في هذا السياق استنادا إلى 50 موظفا من أربع شركات مشهورة مثل مجموعة الطويرقي والمراعي وناديك والصافي وتم الرد على أسئلة البحث في أسئلة مغلقة.

بالإضافة إلى ذلك ، حدد البحث التقنيات المختلفة المطبقة في SCM في المملكة العربية السعودية. وأيضاً سلط هذا البحث الضوء على تأثير التقنيات في إدارة سلسلة التوريد. وبصرف النظر عن ذلك ،حدد البحث التحديات والقضايا المرتبطة بالتقنيات التطبيقية في SCM.

وبناءً على النتائج ، تم إنشاء توصيات للبحث لتطبيق نظام تخطيط موارد المؤسسات الحديث للتحكم في تكلفة المنظمة والحد من القضايا المتعلقة بالتكنولوجيا.

Introduction to Supply Chain Management (SCM) and associated technologies

The business scenario in global aspect has been changed a lot and now it is not limited to the organizational rivalry but to the supply chain management level. Competitive advantage can be ensured with understanding of the practices in SCM and developing the profitability with application of modern technologies (Mangan &Lalwani, 2016). All the stages in the supply chain management needs to satisfy the linked consumers which is initiated with suppliers and passes through manufacturing, distribution, and retailing and reach the consumers (Tatoglu et al., 2016).

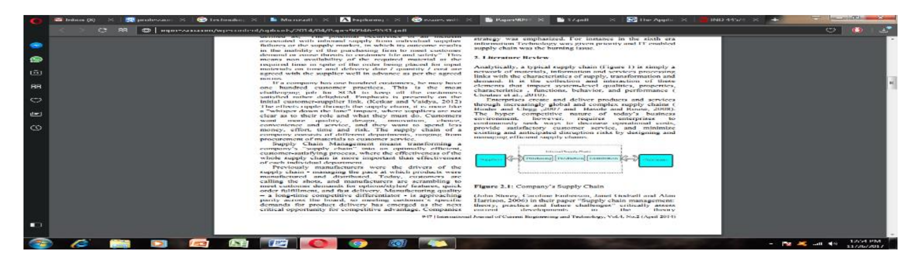


Figure 1: Components of the SCM process

(Source: Yao &Minner, 2017)

The process is merely the oversight of involved finance, consumers, manufacturers, retailer and wholesaler. The functional area of supply chain is consisted of three types of flow such as product flow, information flow and financial flow where the application of technology is possible (Khan et al., 2016). The major technological applications in SCM are Automatic identification technology, Communication technology and Information technology. In addition, it is evident that the use of these technologies can create problem in terms of technological complication (Alkraiji et al., 2016).



Background of SCM in Saudi Arabia

Development in the business infrastructure in Saudi Arabia from the end of the government has ensured the development of the business in the country. The country is focusing towards the generation of work force that can provide support towards the required economy of the country and it is estimated that the workforce will rise from 3.1 million to 4 million by the end of 2020 (Ferrer &Medhekar, 2016). The investment of $400 billion in business infrastructure between the year 2008 to 2013 has initiated the return from the years 2016 and more organizations are invading for business in the country (Yao &Minner, 2017).

Successful business in the country is linked with the maintenance of better SCM in business. The major export items in the country are concerned with oil and oil-related products however, the country is one of the major importers of products and services from the global economy (Voss et al., 2017). The government of the country is concerned about developing efficient economic and technological infrastructure for the operating business organizations. The Saudi Industrial Development Fund (SIDF) and the Saudi Arabian General Investment Authority (SAGIA) are the major regulators of the economic investment in different aspect of business and supply chain aspect (Ross, 2016). It has aided the SMEs of the country a lot and generating the implementation of information technology, e-commerce and other technological advancement in the supply chain maintenance of business to ensure improvement.

Research Rationale

What is the issue?

The improvement of the technology mainly in information technology aspect has improved the supply chain management of Saudi Arabia. It has developed an important blend of technology and business in the country. It has generated the aspect of E-SCM and thus it has been found that depending on the application some technological complications and related governmental investment issues (Busse et al., 2017). The quick development of the supply chain and application of various improved technologies are generating the problem for operating MNCs and the SMEs in Saudi Arabia.

Why it is an issue?

The major existence and prevalence of the issues are concerned with the integration challenges of the SCM with the technology and with the government acceptance scenario. In this regard, it has been found that the Micro and macro environmental effect along with the technological challenges are the main reason behind the creation of the problem. In case of micro environment strategic flexibility maintenance and measuring the SC benefits are creating the problem whereas, in macro level effect of globalization and business process integration are the problem. In addition, technological challenges in Saudi Arabia SCM process are associated with Data and Information integration and extranet adoption in the process (Ferrer &Medhekar, 2016).

What does the research shed light on?

This research is focusing towards the identification of the implied technologies, which are prevalent in the supply chain management of Saudi Arabia and the associated challenges,



which are creating the problem for the involved business organization. Proper development of the technologies and the application are necessary to practice effective business operations in the country.

Research Objectives

The research is associated towards the identification of the technologies being applied in the SCM of Saudi Arabia's business scenario and the associated issues. Depending on that following research objectives has been developed-

- To determine the various technologies applied in the SCM of Saudi Arabia
- To understand the impact of the technologies in the supply chain management
- To identify the associated challenges and issues with the applied technologies in SCM

Research Questions

- What are the various technologies applied in the SCM of Saudi Arabia?
- What are the impact of the technologies in the supply chain management?
- What are the associated challenges and issues with the applied technologies in SCM?

History of supply chain management

Considering the insight of the supply chain development in business is associated with the specific stages of evolution and technological development. The era of supply chain management can be sub-divided under following era-

- Creation Era
- Integration Era
- Globalization Era
- Specialization (Phase one)
- Specialization (phase two)
- Supply chain (SCM 2.0) (Vasquez &Medhekar, 2016)

As opined by Afolayan et al. (2016), the computerization of the information opened the way to a colossal open door for developments in coordination arranging, from randomized capacity in distribution centers to improvement of stock and truck directing. The advancements, especially those from the operational area that the management had to this point just possessed the capacity to look at in hypothetical models had now turned out to be substantially nearer to reality. The consequence of this change to ERP frameworks was a gigantic change in information accessibility and precision. In the words of Papadopoulos et al. (2016), the new ERP programming additionally significantly expanded acknowledgment of the requirement for better arranging and reconciliation among coordination segments. On the contrary, Paulraj et al., (2017) Inventory network Management is the fundamental, vital coordination of the conventional business capacities and the strategies over these business capacities inside a specific organization and crosswise over organizations inside the store network for the motivations behind enhancing the long-haul execution of the individual organizations and the production network overall business management initiative.

In the words of Papadopoulos et al. (2016), in the globalization era of supply chain management it has been seen that organizations are implementing more in this era to increase the level of product distributions. Apart from this, it can be said that the inventory management



initiative of the company provide potentiality to the organization to improve the level of distribution efficiency. As opined by Tatoglu et al. (2016), in the increasing term of supply third party are involved in this course of action in order to provide the organization sustainable growth and development initiative. Apart from this, it can be said that in the process of system management logistics technologies are implemented to increase organizational level of business efficiency (Sari, 2017). In the increasing terms and conditions of business management sufficient growth and development has been pointed out through the suitable innovation of proper technology in the organization. Logistic efficiency has been found in the organization through the sustainable development of technology.

Supply chain dimensions and the determination of the strategies

The current business environment in Saudi Arabia is characterized by constant change, increased uncertainty of demand, shorter production cycle. These are the norms that most companies in Saudi Arabia are facing and they all are making efforts so that they have sustainable sources for gaining competitive advantage (Singh, et al., 2017). The supply chain dimensions would reflect on the ability of the companies so that they adjust the tactics and manage operations accordingly in the supply chain. The supply chain dimensions can be given as:

Alertness: this dimension reflects on the ability of the SMEs to detect the changes in the supply chain as well as the opportunities and challenges. The dimension of alertness in supply chain would help the SMEs to making any change that may be needed so that the requirements and deficiencies can be adjusted and the required technology can be implemented (Tatoglu et al. 2016).

Accessibility: the dimension of accessibility is the ability to procure the supply chain related information with the use and application of the best technological applications. With greater accessibility to relevant data, the supply chain management of logistics would be possible and this would further help to determine real time demand, production information and inventory management (Tipu&Fantazy, 2014).

Decisiveness: in supply chain management, the decisiveness is very important as it is very important to take the right action in the right time with the available information. In this respect, Gandhi et al., (2017) opined that the use of technology in supply chain can help to take quick decisions so that any time lag can be avoided. Thus, through use of technology, resolute decisions can be taken and response to changes would also be effective.

Flexibility: in the context of supply chain, flexibility can be described as the ability of the SME to modify the range of activities and placement of different components of supply chain in the supply chain operations (Grant et al., 2017). The use of technology would help the SMEs to be flexible in their approaches to production and would also assist them in innovation.

Based on the supply chain dimensions, the strategies can also be determined that needs to be followed for optimization of the supply chain operations (Busse et al., 2017). The strategies in supply chain of the SMEs are determined as the framework of some elements such as: industry framework, unique value proposal; internal processes and the managerial focus.



The industry framework includes the interaction of suppliers, technological development, demand variation; and economic factors. The strategies would thus include market mediation costs and the product lifecycle (Thunberg et al., 2017). The ERP solutions need to be integrated

with the supply chain operations and it standardization also needs to be incorporated in the product lifecycle so that the market costs can be optimized (Awais Ahmad Tipu&Fantazy, 2014).

Internal processes need to be integrated with the best use of technology and IT operations. The internal processes would include the supply chain operations and the participants involved in the supply chain. With appropriate use of information, and data use and data processing, the supply chain operations can be optimized (Skippari et al., 2017).

The managerial focus also needs to be optimized in a manner that the best technology is utilized in the supply chain operations. This can be done through the use of supply chain information technologies and through system design and user interface operations.

Technologies applied in the SCM

In the words of Ross (2016), Supply chain optimized organizational productivity in the imperative business era. Better visibility within the era of supply chain use of different type of technology has been seen that control, improve and maintain supply chain management related issues and provide a sense of simplicity to control over the business inventory management. In the words of Yan et al. (2016), in enhancing customers satisfaction process use of different type of technology is justified as it not only demonstrates the product distributional era but also integrate a modern business improvement initiative through the suitable technological innovation.

Computerized shipping and tracking:

As opined by Tatoglu et al. (2016), in the aid of modern technology, application of end based software like transportation management software (TMS) can simplify the supply chain management process of the SMES and MNCs of UAE. According to Brindley (2017), the ERP system measurement can provide efficiency on the tracking and distribution management system of the organization. The software allows to digitally organizing the data management process of the organization that reduced the time spent shipping process. Automated bar coding technology of the organization has simplified and motivated initiative that reduced the time spending shipping process of the organization (Taylor &Arthanari, 2017).

Radio Frequency identification (RFID):

In the words of Papadopoulos et al. (2016), innumerable benefits can be provided through the application of RFID technology in the organization. RFID chips are placed in every product to have enough understanding on the positioning of the product in the business market. Apart from this, it can be said that the products and service related sustainability of the organization can be identified very properly through the strong tracking system (Skippari et al., 2017). In the supply chain management logistic system, use of the FRID is one of the most significant factor that helps to increase consistent tracking and shipping process of the organization. The business owners can be enabled to track huge number of products within



the limited span of time. As opined by La Scalia et al. (2016), the control visibility system of the organization and products and service related queries can be managed through the computerized database management system. Apart from this, it can be said that through the implementation of the chips in every product tracking management system of the organization can be managed properly. On the contrary, Thunberget al., (2017) process has suitable and effective process in this course of action where numerous possibility of making integrated supply chain management system of the company can be managed. The products and service related potential barrier of the company could be removed as per the efficiency level of supply chain management logistic system.

E-commerce in the supply chain management technology:

In the words of Yao &Minner (2017), electronic media are significantly used in the supply chain management process of the organization for the information sharing process. Good planning and lower inventory management initiative of the organization can be determined in the application of supply chain management technology in the organization. In the process of product distribution in the market this process helps to reduce the data related problems in the organization along with the effective technical supportive management (Albliwi et al., 2017). The network frequency is matched with the bar codes and can easily track the products in the market. Apart from this, it can be said the process has significant impact on the products monitoring process at the time of market distribution. The most significant factor is that products that are ordered by the consumers can easily come in to the market through the proper monitoring process.

Transport management software:

As opined by Afolayan et al. (2016), the use of computerized shipping process in the organization has very effectiveness in order todeal with the effective supply chain management process of the organization. The use of computerized shipping and tracking reduced the time of distribution as well as the labor cost in the market. All the process isintegrated in this course of action where panels are maintaining by the management of the organization to manage the tracking system very effectively (Grant et al., 2017).

Communication technology:

In the words of Zhuo& Wei (2017), electronic data exchange technology has been used in the organization to transfer other documents from the organization. With the EDI data exchange management facility, the management of the organization can be able to driven up the data that are related with the product and service related sustainability. The transaction process can be conducted very faster through this driven up technology (Busse et al., 2017). Big level of data can be arranged by the management of the organization in order to deal with the higher level of productivity. Email data are not structured where it has been seen that the management related software system is not arranged properly.

Issues and Challenges with the SCM process

Based on the technological application in the supply chain management process it has been found that the occurrence of complication and issues are very common in this field. The major areas that are associated with facing the issues with the rising extent of the technology is concerned with the warehousing, network design, transportation, inventory and storage, and



materials handling department (Singh et al., 2017). The application of the technologies is designed for the purpose of controlling massive orders and large target in the business market. This it has been found that in initial stage when the orders are very few the consumer attention towards the excess inventories and it create problem for sudden rise in the orders for the organization (Gandhi et al., 2017).

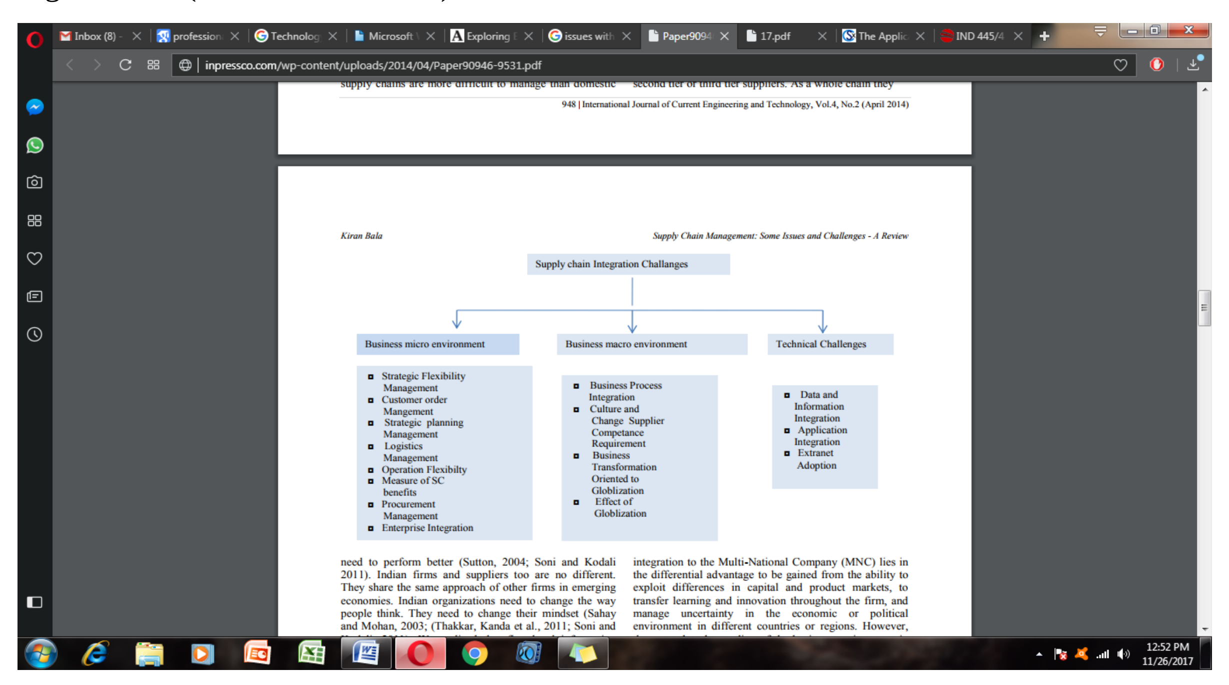


Figure 2: Integration Challenges in SCM in Saudi Arabia

(Source: Vasquez &Medhekar, 2016)

In addition, it has been found that the issues in the inventory process is concerned with the micro and macro environment related issues along with the technology based challenges in the supply chain management process (Vasquez &Medhekar, 2016). Considering the technological application, it has been found that the integration process of the technological application faced the issues related to extranet adoption along with the data integration concern. The technological application in SCM is concerned with the sharing of information in the chain and it is considered as one of the major hurdles for the process. In case of Saudi Arabia, it has been found that the majority of the organizations are reluctant towards sharing of the sensitive cost related information (Sari, 2017). In certain aspect, it has been found that majority of the organizations in the country concerned with the fact that implementation of a cross-organizational information system is costly, time-consuming and risky (Fernie& Sparks, 2014). The major reason behind this is concerned with the lack of technical knowledge for the operating employees. Considering the technical implementation, complications related to technical system specification such as maintenance of EDI standards and splitting the cost of the system integration are prevalent. Apart from that, it is possible that the PC complications can enhance the hurdle for the development of the technical applications (Paulraj et al., 2017). Furthermore, it is evident from the existing technologies such as RFID, transport system and communication maintenance software that these technologies are unable to develop the



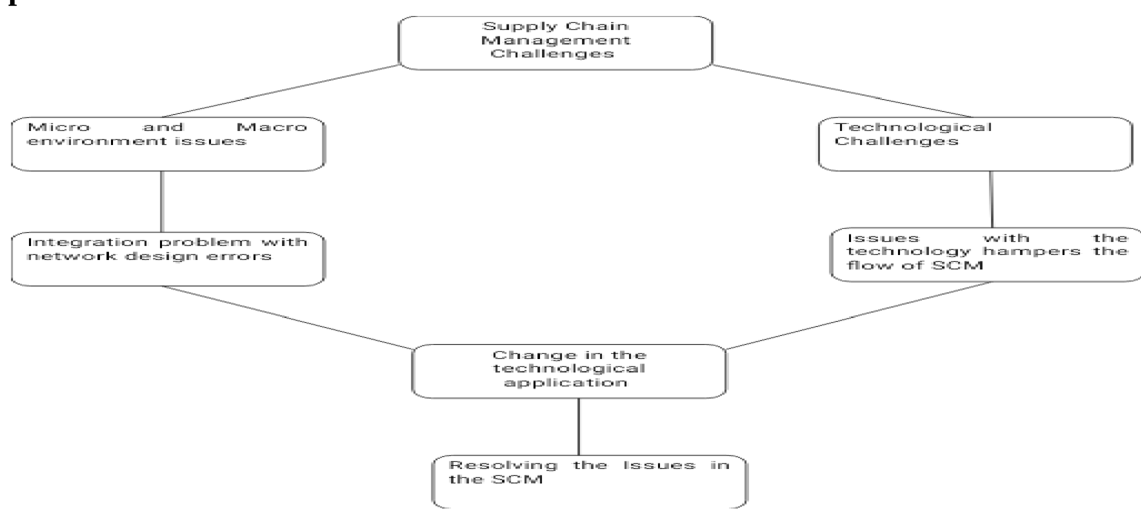
forecast of supply chain data based on the POS data from the retailers. It creates the problem related to the supply chain network design process for the organizations.

Gap analysis

The research work of Mosa Saleh Al Haddad Al (2012) on 'Supply chain management: a model for implementation for SME's in Saudi Arabia' has highlighted that the SMEs in the Saudi Arabia are concentrating towards the lean operation with the effective application of the technological aspect (Syed, 2012). The statistical analysis in the research has generated the idea regarding the supply chain dimensions and highlighted the robust framework which is creating some problem for the organizations. The research has provided several insights towards the current condition of the SMEs. However, the gap is associated with the lack of information towards the MNCs and less information are available with the technological implication and the associated problems.

On the other hand, the research work by Bala, (2014) on 'Supply Chain Management: Some Issues and Challenges - A Review' it has been found that the technological problems are prevalent with the micro and macro environmental issues but the nature and variation of the problems are not highlighted in appropriate manner. However, some specific data related to practical problems have been highlighted in the research. The research work of Bhandari on 'Impact of Technology on Logistics and Supply Chain Management' has indicated the application of information technology, communication technology and automatic identification technology but have the limitation towards highlighting the issues (Bhandari, 2014). Thus, the research is concerned with highlighting the major technologies in modern times used in Saudi Arabia for SCM and the associated issues that the organizations are facing in the country.

Conceptual Framework



Research Outline

Research outline is associated with the framework development of the research that represent the research issues with the application of tools and techniques. Proper tools are effective for the fulfillment of the goals of the research (Humphries, 2017). The research onion is the most efficient tool that can provide effective conclusion for the research.



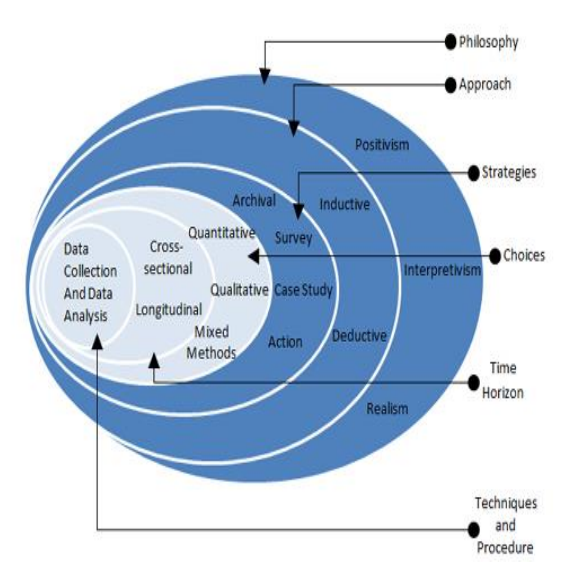


Figure 3: Research Onion and Research Framework

(Source: Humphries, 2017)

The application of the epistemology is essential in this context which is associated with research philosophy, approach, strategies, choices, time horizon and techniques and procedure. Based on the application of these techniques essential results regarding the associated issues can be determined in the context of Saudi Arabian supply chain management.

Research Philosophy

In this research, the application of Positivism can determine the hidden facts associated with the challenges in technological application in supply chain management in Saudi Arabia. The application of the modern technologies in the developing market od Saudi Arabia is evident and it is an established fact (Padilla-Díaz, 2015). The organizations which are contributing towards the application of the technology on SCM are subjected to follow the development of some issues related to technological follow up or fault (Taylor &Arthanari, 2017). The hidden facts can be established through the positivism only. The application of interpretivism and realism is not possible as the impact of people's view will have no impact on the existing issues regarding the technological practices. Thus, these two techniques have been cancelled out for this research.

Research Approach

The application of Deductive research approach can extract the necessary information with the top-down approach. The information can be identified with the theoretical model application. The major acceptance of the research is concerned with the establishment of the research findings related to the issues that can bother the organization for SCM with logical flow of data gathering and analysis (Lewis, 2015). There are associated theories and models with the supply chain management practices and thus the deductive approachis effective for providing proper insight towards the research. Relevancy of the issues with the technological implications are important in terms of deductive approach. Thus, the inductive approach has been ruled out as it will take much time to complete and no new theory development is linked



with the objective of the research (Herz et al., 2017). Flexibility aspect is another concern that have led towards the rejection of the inductive approach application.

Research Design

In this regard, the exploratory research strategy application has explained the findings with relevance with the literature extraction (Weber, 2017). The application of the exploratory research design is concerned with the understanding the issues associated with the supply chain management process in Saudi Arabia. The organizations are applying various technologies in the supply chain performance enhancement which is developing some complexities and proper exploration of the data is possible with exploratory research design (Olohan, 2017). The other designs have been ruled out because the explanation of the findings is not enough to justify the research aim and objectives.

Data Collection Process

For the effective collection of the research data it is essential to maintain the focus towards the application of the data collection technique in the practical concern. In this regard, it has been found that the data can be collected based on primary sources and secondary sources. The primary data collection process can be sub-divided under quantitative and qualitative data collection methods (Creswell & Poth, 2017). The quantitative data collection is associated with the formation of closed ended question and qualitative data collection is based on open-ended question. The numerical data generation with the help of quantitative research data collection is possible with the application of survey and the qualitative data collection is relied upon the conductance of interview. On the other hand, secondary data is dependent on the collection and representation of the information gathered from relevant articles, journals and published work.

Primary research data collection has been applied to collect the data from the human resources. The application of quantitative research data collection has been applied in this research (Humphries, 2017). The research has taken the aid of the survey conductance in online platform. Foe this process five renowned organization of Saudi Arabia has been selected for the generation of the data (Herz et al., 2017). The employees of the organizations have been approached to generate the survey data in online method. The data collection is concerned with the understanding of the demographics details of the respondents and it is based on the research objectives which can justify the research questions for this particular research. Understanding of the age, gender and geographic location is important for the research to consider the impact of these factors towards the factors of and variables of the questionnaire (Lewis, 2015). Time horizon maintenance is another important concern that have been maintained in this research as the survey gathering and analysis of the data is required to be performed under a specific timeline. However, quick collection of data sometimes develops research biasness for the ongoing research.

For this research the understanding of the technological application in the SCM and the impact of the technologies in generating such issues can be determined with reliable secondary data information. The literature concept generation is associated with this fact. The sources of the literature material decide the reliability of data, thus in this case peer reviewed journals have been used for reliable data collection.



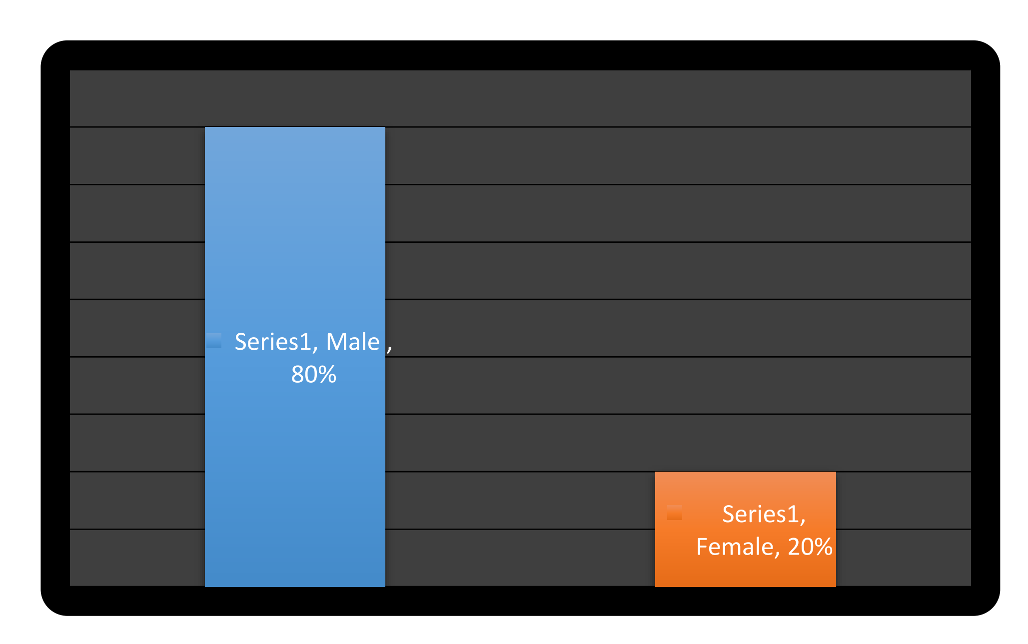
Sampling Technique

To collect the necessary information from the respondents, 120 employees with managerial control of various organizations in Saudi Arabia has been approached and among that 50 respondents have provided the concern of voluntary participation in the survey. The selection of the employees is associated with the decision regarding the election of the employees and it is concerned with the maintenance of the balance between the organizational selection so that the exact scenario of the SCM and technological implication on that can be understood. Al Tuwairqi Group , Almarai , Nadec and Al Safi has been selected for the employee based online survey and collect the close-ended response. The consent has been recorded over online platform and the data has been represented in graphical and tabular formation. It is beneficial for the research to maintain the coalition between the literature findings and the data analysis.

Quantitative Research

1. What is your gender?

Options	Response frequency	Response percentage	Total number of Respondents
Male	40	80%	50
Female	10	20%	50



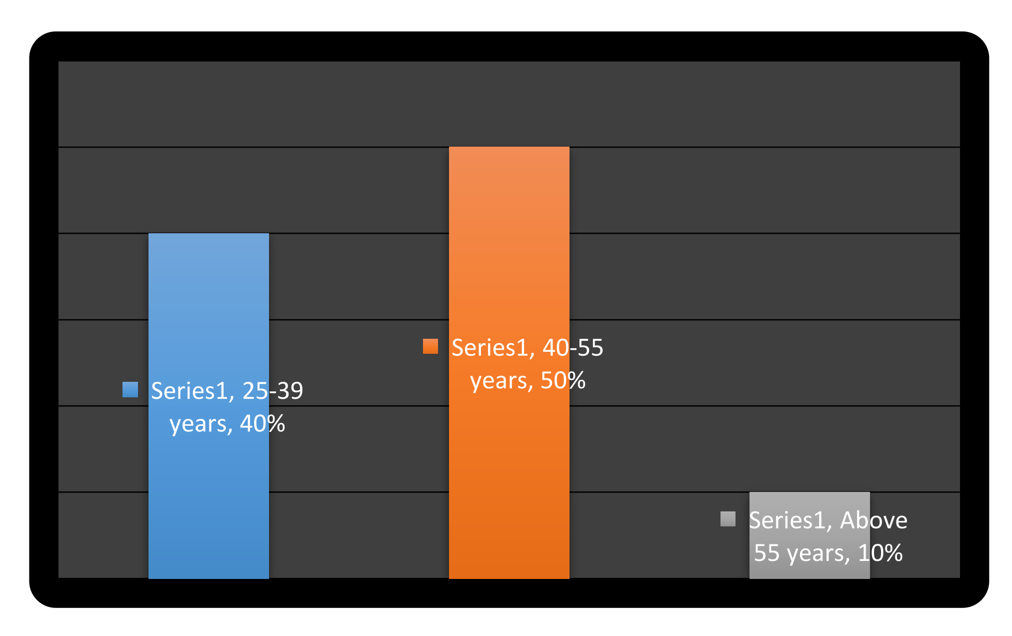
Graph 1: Gender of the respondent



2. What is your age?

Table 2: Age of the respondents

Options	Response frequency	Response percentage	Total number of Respondents
25-39 years	20	40%	50
40-55 years	25	50%	50
Above 55 years	5	10%	50



Graph 2: Age of the respondents

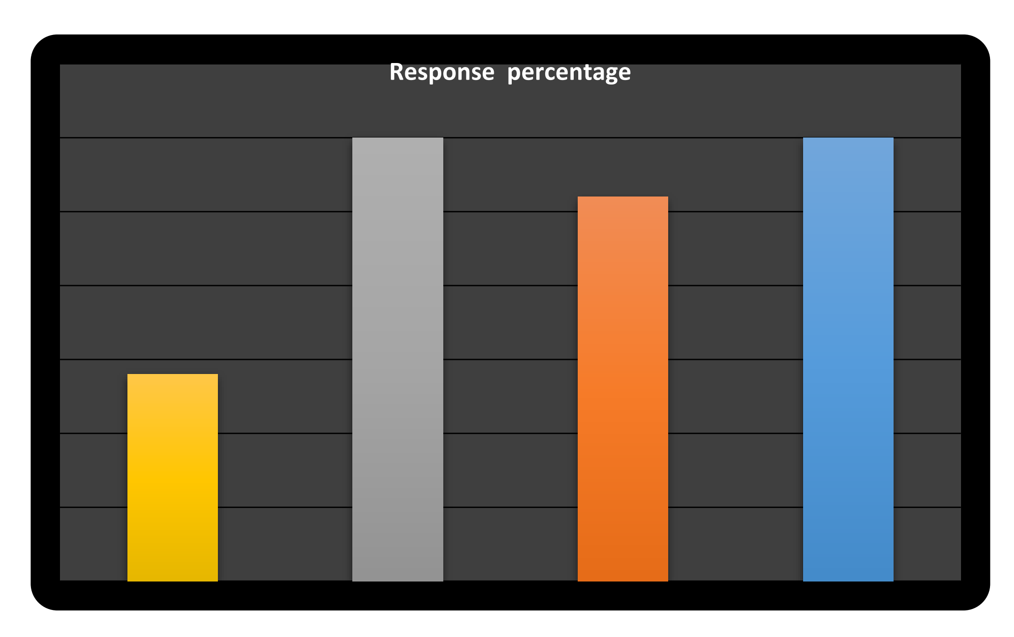
3. What is your organization?

Table 3: Organization of the Respondents

Options	Response frequency	Response percentage	Total number of Respondents
Al Tuwairqi Group	15	30%	50
Almarai	13	26%	50



Nadec	15	30%	50
Al Safi	7	14%	50



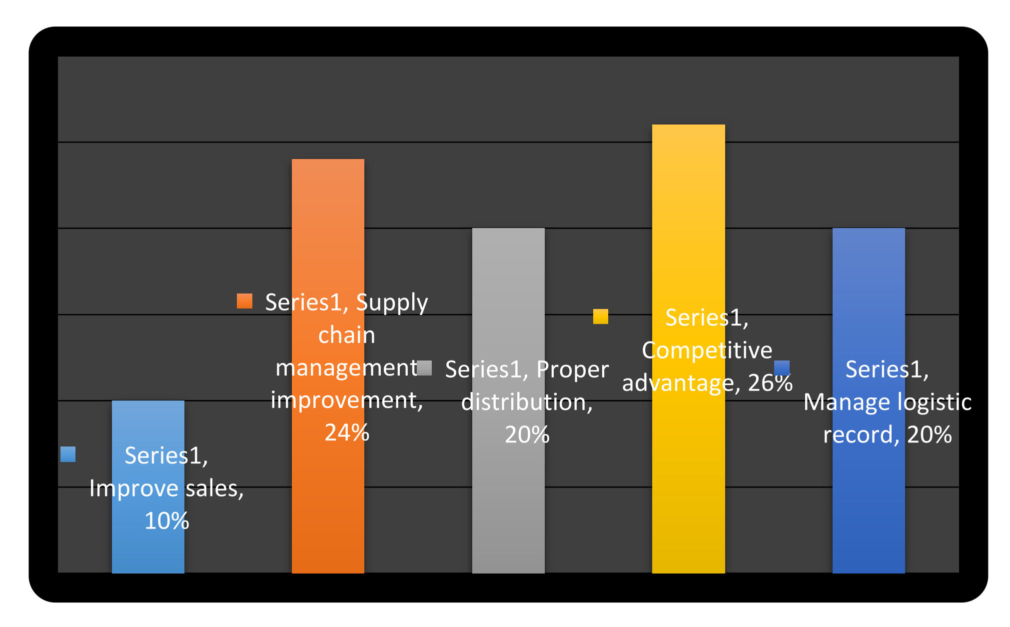
Graph 3: Organization of the Respondents

4. What is the core impact of technology in the supply chain management system of the organization?

Table 4: Technology in the supply chain management

Options	Response frequency	Response percentage	Total number of Respondents
Improve sales	5	10%	50
Supply chain management improvement	12	24%	50
Proper distribution	10	20%	50
Competitive advantage	13	26%	50
Manage logistic record	10	20%	50





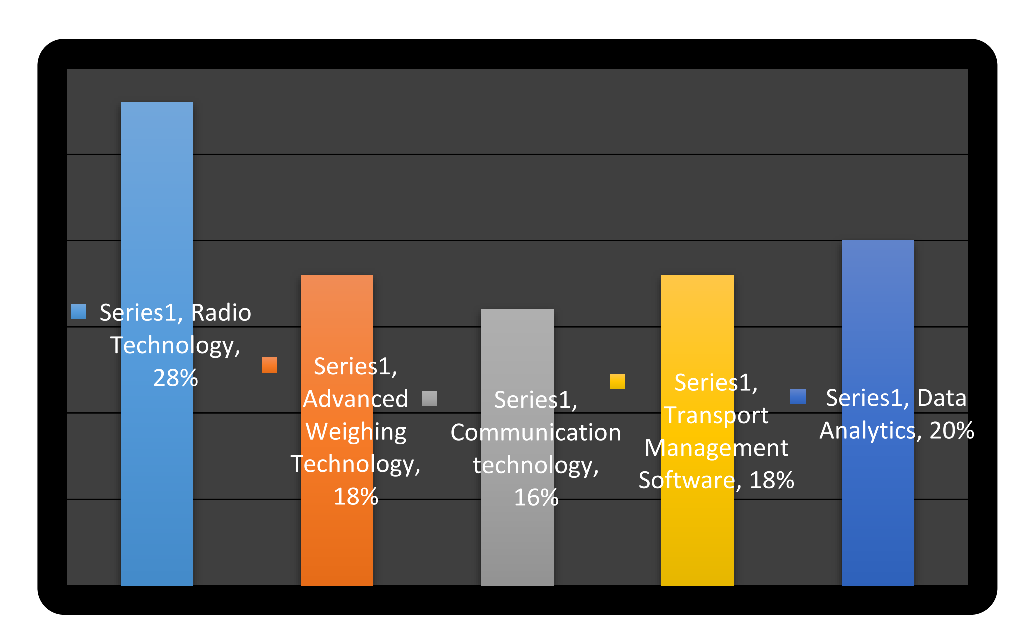
Graph 4: Technology in the supply chain management

5. What are the suitable technologies used in the company to drive up SCM system?

Table 5: suitable technologies used in the company to drive up SCM system

Options	Response frequency	Response percentage	Total number of Respondents
Radio Technology	14	28%	50
Advanced Weighing Technology	9	18%	50
Communication technology	8	16%	50
Transport Management Software	9	18%	50
Data Analytics	10	20%	50



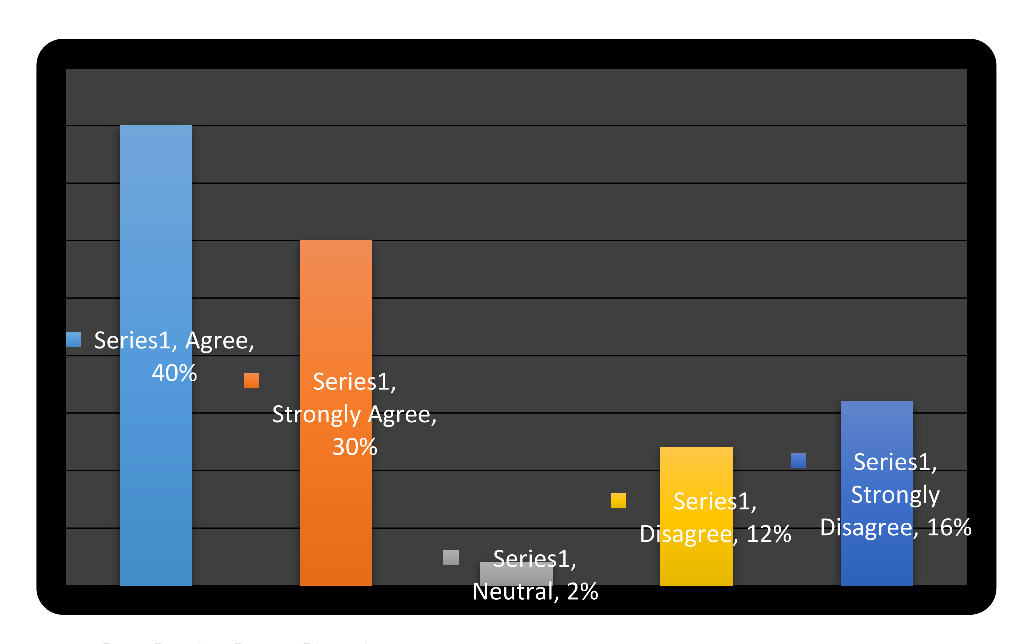


Graph 5: suitable technologies used in the company to drive up SCM system

6. How far do you agree that the logistic system of the company can be improved through technological application?

Table 6: Technological application

Options	Response frequency	Response percentage	Total number of Respondents
Agree	20	40%	50
Strongly Agree	15	30%	50
Neutral	1	2%	50
Disagree	6	12%	50
Strongly Disagree	8	16%	50



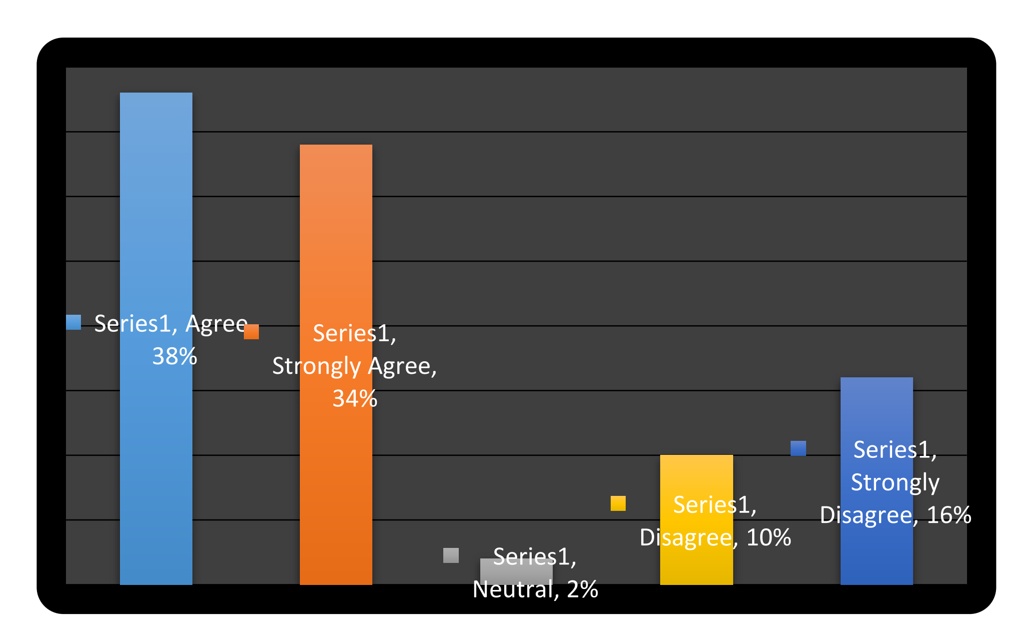
Graph 6: Technological application

7. How far do you consider about the application of **Advanced Weighing Technology** in SCM system for better achievement?

Table 7: Application of Advanced Weighing Technology in SCM

Options	Response frequency	Response percentage	Total number of Respondents
Agree	19	38%	50
Strongly Agree	17	34%	50
Neutral	1	2%	50
Disagree	5	10%	50
Strongly Disagree	8	16%	50





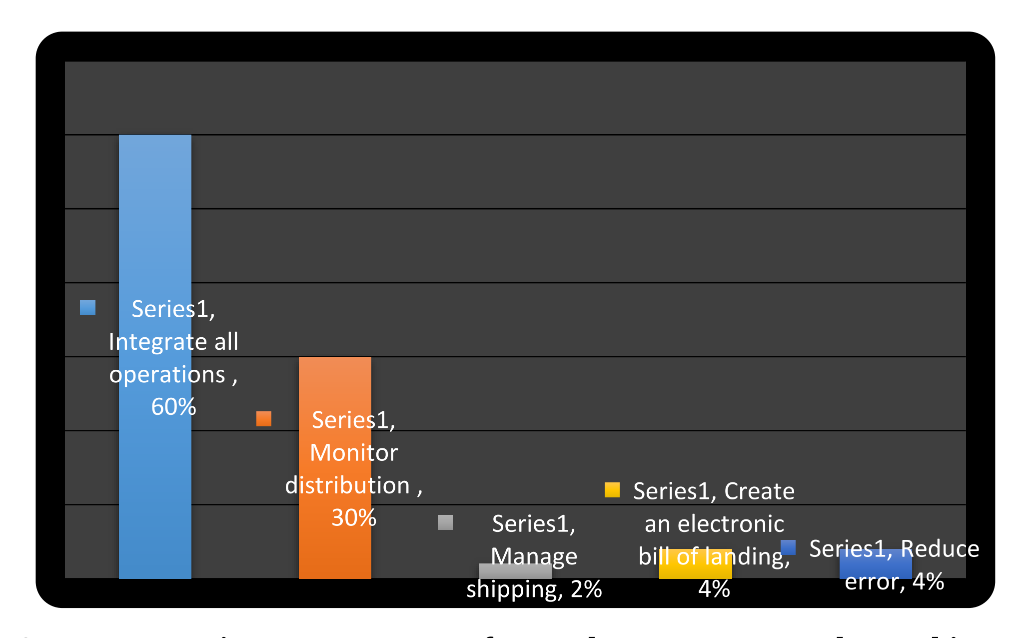
Graph 7: Application of Advanced Weighing Technology in SCM

8. How does **transportation management software** demonstrate over the tracking system on logistic?

Table 8: Transportation management software demonstrate over the tracking system

Options	Response frequency	Response percentage	Total number of Respondents
Integrate all operations	30	60%	50
Monitor distribution	15	30%	50
Manage shipping	1	2%	50
Create an electronic bill of landing	2	4%	50
Reduce error	2	4%	50



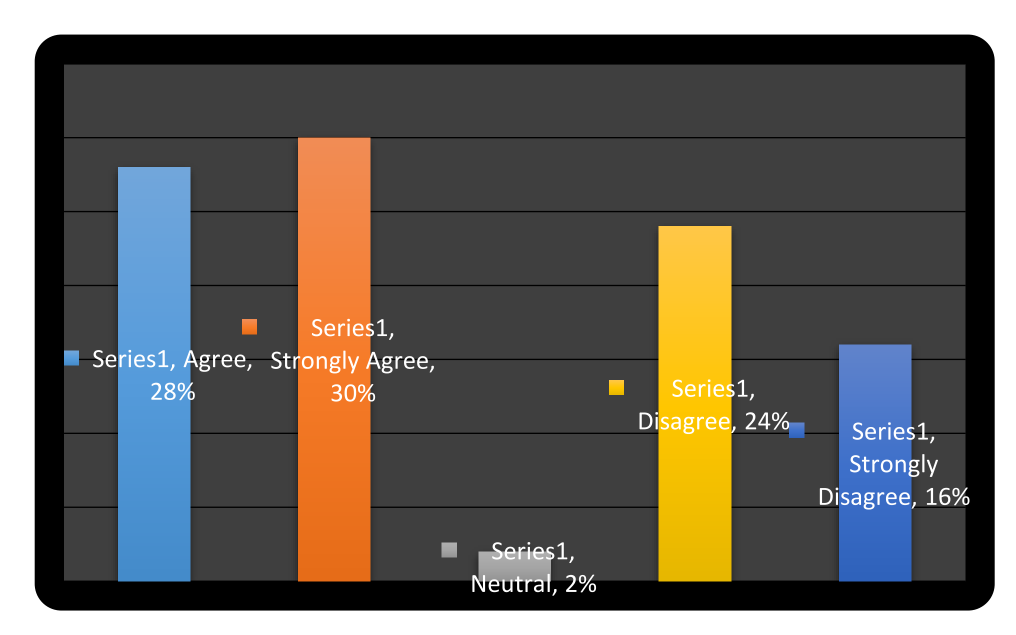


Graph 8: Transportation management software demonstrate over the tracking system

9. How far do you agree that **Communication technology**optimizes supply chain operation of the SMEs and MNCs of Saudi Arabia?

Table 9: Communication technology optimizes supply chain operation

Options	Response frequency	Response percentage	Total number of Respondents
Agree	14	28%	50
Strongly Agree	15	30%	50
Neutral	1	2%	50
Disagree	12	24%	50
Strongly Disagree	8	16%	50



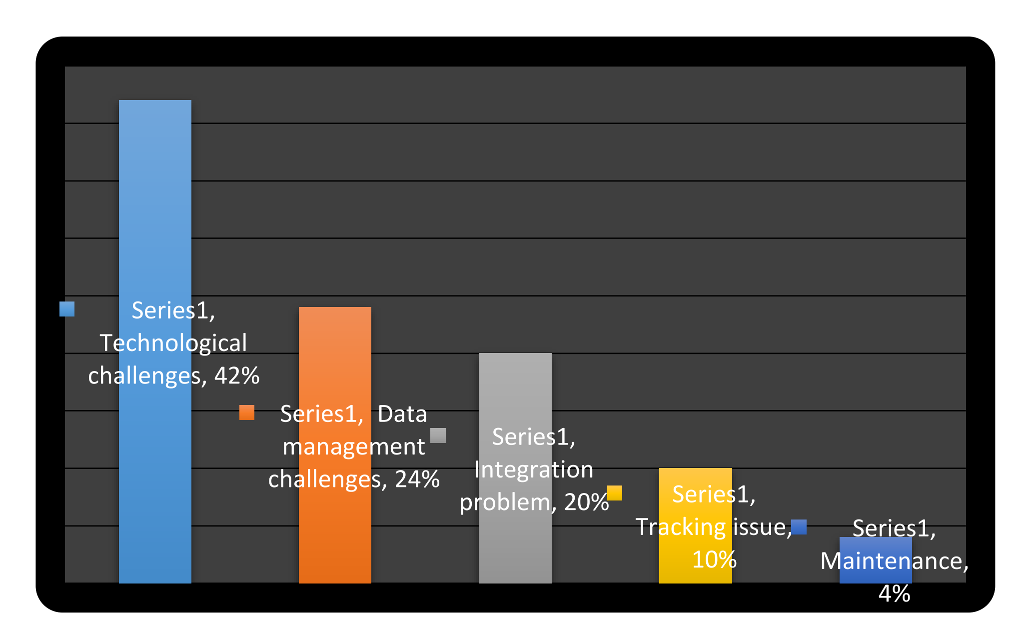
Graph 9: Communication technology optimizes supply chain operation

Q10. What are the challenges faced by the SMEs and MNCs of Saudi Arabia to drive on their SCM system through technology?

Table 10: Challenges faced by the SMEs and MNCs of Saudi Arabia

Options	Response frequency	Response percentage	Total number of Respondents
Technological challenges	21	42%	50
Data management challenges	12	24%	50
Integration problem	10	20%	50
Tracking issue	5	10%	50
Maintenance	2	4%	50





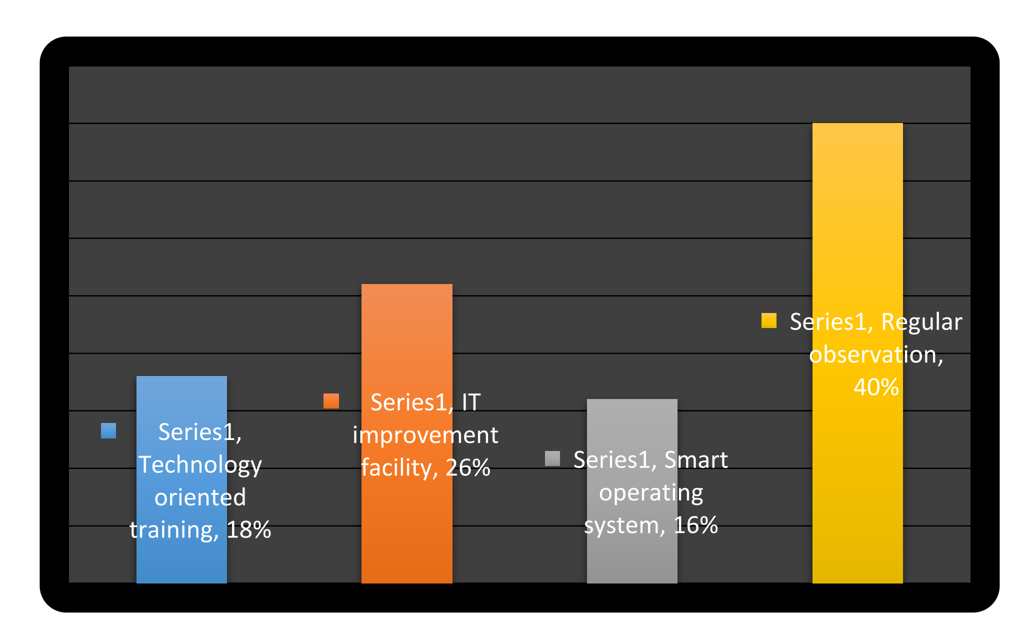
Graph 10: Challenges faced by the SMEs and MNCs of Saudi Arabia

Q11. What are the strategies of Saudi Arabia companies to mitigate technology driven SCM system?

Table 11: Strategies of Saudi Arabia companies to mitigate technology driven SCM

Options	Response frequency	Response percentage	Total number of Respondents
Technology oriented training	9	18%	50
IT improvement facility	13	26%	50
Smart operating system	8	16%	50
Regular observation	20	40%	50





Graph 11: Strategies of Saudi Arabia companies to mitigate technology driven SCM

Recommendation

The recommendation has been represented as follows :

- Government initiatives are essential to aid the import of latest technologies for the organizations that can support the development of the supply chain in efficient manner.
- Technological knowledge generation is important for the people operating the supply chain .
- Data insight generation is another method that can reduce the extent of technological issues for supply chain. It has been found that the accurate and timely data maintenance is the key to ensure success for the supply chain development in Saudi Arabia.
- The technological issue control can be controlled with the inclusion of vendor performance monitoring system. It is cost effective in nature and it can be monitored and rated through robust metrics available through ERP systems. Proper vendor cycle monitoring is beneficial for the reduction of supply chain issues in overall scenario and for re-negotiation process.

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